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TWO NOTABLE ASTRONOMICAL MEETINGS

By ROBERT G. AITKEN

It is not intended, in the present article, to give a systematic review either of the meeting of the International Astronomical Union held in Rome on May 2-10, 1922, or of the centenary meeting of the Royal Astronomical Society of London, held on May 29-31. An authoritative account of the former is printed in *The Observatory* for June, 1922 (pp. 176-190), and of the latter, in the June number of the *Monthly Notices, R. A. S.* (431-443), and to these the reader is referred with the assurance that he will find every page of both reports full of interest. It is rather my purpose to remove, as far as possible, a misconception as to the object of the Rome meeting, evidenced by questions that have been put to me both before and after the meeting, to set forth in a general way what this meeting accomplished and to record some of the impressions and experiences of a delegate who had the privilege also of attending the memorable meeting in London.

The meeting of the International Astronomical Union at Rome was not, as many people interested in astronomy seem to think, one for the presentation of the results of original investigations conducted by the members present. Not a single paper of this kind was read at any of the sessions, although the work in practically every field of astronomical research was passed under review. It was essentially a business meeting; a meeting called to discuss ways and means of providing for closer cooperation among astronomers engaged in similar lines of work in the seventeen countries now adhering to the Union¹ and in the others which may later join; for cooperation is quite as essential to progress as the extreme specialization which is so prominent a characteristic of all present day scientific research. Before the world war interrupted their activities, such organiza-

¹Fifteen countries were represented at Rome, viz: Australia, Belgium, Brazil, Canada, Czecho-Slovakia, Denmark, France, Great Britain, Holland, Italy, Japan, Mexico, Norway, Poland and the United States. Greece and South Africa were not represented, though adhering to the Union. Roumania and Spain had delegates present though the formalities connected with adhesion to the Union had not been completed.

tions as the Astronomische Gesellschaft, the Comité Permanent de la Carte du Ciel, and the International Union for Solar Research had done and were doing admirable work along these lines. At the close of the war, it was found desirable to re-organize some of these associations and to bring them into a single union which should include every branch of astronomy.

The International Astronomical Union was therefore organized at Brussels in July, 1919, under the auspices of the International Research Council, provision being made by the council, the same time, for the organization of similar unions for the other sciences, several of which were formed immediately. The new unions differed from the older international societies in many details and, frankly, had to be regarded as experiments, the outcome of which was more or less uncertain. The experimental stage is now safely passed; the meeting at Rome was unquestionably a successful one and all delegates present agree that it marked a long step forward in cooperative work in astronomy. In its main outlines, the plan of union, formulated at Brussels, remains unaltered, but a few changes in detail were made, suggested by the thirty-two committees which were the actual working units of the Union.

These changes all relate to the committees. Originally, the various phases of solar research were distributed among four committees, but their boundaries were found to overlap, and three of the committees are now merged into one, dealing with all questions relating to solar physics. At Brussels, the *physical observations* of the major planets (*Mars, Jupiter*, etc.) were assigned to one committee, all questions relating to minor planets to a second, those relating to comets to a third. Now the work is better divided between two committees, one looking after the *physical observations* of the planets (major and minor), comets and satellites, the other, the *positions* (and orbits) of minor planets, comets and satellites. Three of the original committees have been dropped; the one on the re-editing of older astronomical works, because under present conditions it did not seem possible to secure funds for such work; the one on astronomical expeditions and eclipses, because sufficient provision for these was being made otherwise; the one on

calendar reform, because it did not seem wise under present conditions to urge a question having so many political aspects.

The net result is that we have now only twenty-six committees instead of thirty-two, and quite aside from other considerations this numerical fact is not without its advantages. The detailed work of the Union, it is clear, must be done by the committees, and the greater their number the more troublesome becomes the problem to arrange for their sessions, at a general meeting like the one at Rome. Practically every delegate will want to attend the meetings of many different committees, many delegates will, in fact, be members of several committees; but it is obvious that time will not permit arranging the committee meetings "in series." They must be placed "in parallel," the schedule being arranged to minimize conflicts of interest.

Another problem relating to the committee meetings had to be solved by the Executive Committee. In the formal organization, each committee is limited in its membership to astronomers, in the various countries adhering to the Union, who specialized in the corresponding field of research. Many committee members, including several chairmen, were unable to go to Rome, and the actual representation of some committees was very small. Some members nevertheless thought that the right to take part in the deliberations in each committee should be limited to its actual membership, but it was wisely decided to open all discussions to any delegate who might be interested.

Astronomers are as positive in their convictions as other men, as tenacious in holding to their individual points of view and as human—shall we say?—in their prejudices and jealousies. Nor are they lacking in ability to express their opinions clearly and forcibly, a fact that was amply demonstrated in the lively debates in various committee meetings. Fortunately, they also appreciate that it is of the essence of cooperation to preserve a spirit of sympathy and mutual understanding—a "give and take" spirit—and the delegates at Rome were strongly animated by this spirit. It was therefore possible to find the right way out in practically every case of disagreement, without impairing the friendly relations of those participating in the discussions.

But what was actually accomplished? I expressly dis-

avowed in my opening sentence any intention of answering this question fully. It requires several hours of close reading to master the "preliminary reports" which were distributed before the meeting and which served as the "*agenda*" for the various committee meetings; the twenty-two pages of the article in *The Observatory*, already referred to, give only brief abstracts of the reports finally adopted by the Union; the full reports, to the editing and publication of which the General Secretary of the Union, Professor A. S. Fowler,² has been unselfishly devoting his vacation, will fill a volume of perhaps two hundred pages! Here I shall give only an idea of what was done by a few illustrations.

An analysis of the carefully prepared reports show that they present, in the first place, a general summary of present day astronomical research and, secondly, (and chiefly) put forward many definite propositions or resolutions, all involving cooperation. These resolutions may be said, in a general way, to fall into three groups. The first group comprises those designed to secure greater uniformity of practice in the matter of nomenclature (both notation and definition), in the choice and definition of standard units, in the selection of epochs for catalogues of stars, in the form of publication of results, etc. Individually, some of these proposals may seem of relatively little importance but others are of great importance and, in the aggregate, the general adoption of all of them will result in a very great gain in precision, in the elimination of confusion and in the saving of time and labor.

Let me give two or three illustrations. Here is a statement prepared by some of my fellow delegates to show the uses, at present, of the single symbol K.

"It would be of interest to study the K-term for the K-line in a spectrographic binary (perhaps K-*Centauri*) in which this line is not stationary but has a smaller amplitude of K than the other lines; although such a line is not a line of K and does not belong to the K-series and cannot be observed in a star of spectrum K because stationary lines appear only when the temperature exceeds 10,000° K."

²In his closing address to the Union, the President, M. B. Baillaud, Director of the Paris Observatory, said that as far as the Executive Committee was concerned, any success they had achieved was due to the hard work and loyal action of Professor Fowler, the General Secretary. Their hearty applause of this statement showed the delegates' appreciation of Professor Fowler's services.

This, it may be admitted, is an extreme case, but there are many other letters and symbols that are now being overworked. Will it not be a distinct advantage to relieve these of some of their burdens, or to discriminate between their different uses by means of parentheses, Italics, etc.?

Or take the element in double star orbits which defines the position of the point of periastron passage with respect to the nodal point. This is now designated sometimes by ω , sometimes by λ , and, what is more serious, the angle is reckoned by some in the direction of the companion's motion, by others in the direction of increasing position angles, and these may or may not be the same. Why not agree upon *one* symbol and *one* definition?

Again, consider the matter of epochs for star catalogues. Catalogues now in constant use give star places for the epochs 1855.0, 1860.0, 1875.0, 1880.0, 1890.0, 1900.0—not to mention others—and intercomparison of these catalogues involves a reduction of the star places to a common epoch. If one or another of only three epochs 1850.0, 1875.0, 1900.0, had been adopted for all of these there would have been no sacrifice of precision, and little if any increase of labor. And think of the saving of time and energy this would have effected on the part of astronomers who have used and will use these catalogues! To insure this saving in the use of future catalogues, the Union approved the resolution presented by the committee on Meridian Astronomy that the epoch 1925.0 be adopted in all catalogues of stars based upon observations made before 1940. It is contemplated that later observations shall be referred to the epochs 1950.0, 1975.0, etc.

The second group of resolutions is concerned with the better coordination of work that is now being done, and that will continue to be done, more or less independently upon the initiative of individual observers, or institutions, as, for example, the observation of variable stars, of double stars, of minor planets, of the radial velocities of stars, etc., and perhaps the majority of theoretical investigations. Under this head comes the decision of the Committee on Double Stars, approved by the Union, to create a central office for all matters pertaining to double star

astronomy. It will be among the duties of this office, (1) to keep observers informed as to what others have done and are doing with a view of preventing unnecessary duplication of work; (2) to send to any observer, *at his request*, lists of stars in special need of measurement at a given time and, (3) to supply data on double stars to any investigator requiring them.

As another illustration, we may cite the plans of the Variable Star Committee "to furnish a bibliography of all important lines of investigation on variable stars, and to publish lists of variable stars of certain special classes with notes on the types of observations desired." It may not be amiss, in this connection, to call attention to the admirable cooperative work now being carried on by the Variable Star Section of the British Astronomical Association and by the American Association of Variable Star Observers which will hereafter have its permanent headquarters at the Harvard College Observatory. The Variable Star Committee of the International Astronomical Union will, it is hoped, not only bring the work of these two great bodies of observers into closer coordination, but will also associate with it the labors of observers in France, Italy, and other countries.

The third group of resolutions relate to what may be designated strictly cooperative programs of work, in the sense that cooperation was contemplated in their very inception. Some of the smaller programs of this class might, it is true, have been carried out by an individual astronomer or institution, as, for instance, the project to bring Galle's catalogue and bibliography of comets up to date by cooperation between the Student's Observatory at Berkeley, California, and the Computing Section of the British Astronomical Association, under the auspices of the Committee on the Positions of Minor Planets, Comets and Satellites. Most of these pieces of work, however, demand cooperation by their very nature, either because they require that observations be carried on through a long series of years at different stations on the surface of the Earth; or, because, from their magnitude, they exceed the resources of any one institution. The investigation of solar phenomena and of the variation of latitude are examples of one class, the work of securing

photographic charts of the entire sky, showing all stars to the 14th magnitude, with a catalogue of all stars to the 11th magnitude, exemplifies the other.

Cooperative work of this kind is, fortunately, not a new thing in astronomy, as the great star catalogue of the *Astronomische Gesellschaft*, sections of which have been completed upon a common plan by no less than fifteen different observatories, will remind us. Nor can we forget the *Cape Photographic Durchmusterung*, the work of the Cape Observatory and the Groningen Laboratory.³

The International Astronomical Union has taken over a number of cooperative programs which had been initiated by other associations and will hereafter direct them through appropriate committees. These include the program of the former Comité Permanent de la Carte du Ciel, that of the International Union for Solar Research and that of the Association Internationale de l'Heure. The last named is perhaps least known to many readers of these Publications, and I shall therefore quote a paragraph from Professor Sampson's Preliminary Report.

"The commission is the outcome of an effort to regulate, for scientific as well as for general purposes, the benefits arising from wireless time signals, which were begun in 1910 from the Eiffel Tower, at the instance of the Bureau des Longitudes. At the invitation of the French Government a conference assembled in Paris in 1913, when the representatives of 32 states agreed upon a convention creating an Association Internationale de l'Heure. The war intervened before this convention was ratified by any of the participants. It is therefore extinct, but its operative part was none the less discharged by M. Baillaud, who had been named as Director of the Bureau, originally at his personal expense, afterwards by employing the staff of the Observatory at Paris. This continued until 1919. When the International Research Council and Astronomical Union were formed at Brussels in 1919, the terms of the statutes of the unratified convention of 1913 were taken as a model, and the Regulations of the Present Time Commission were drawn up, within the organization of the I. A. U."

As to the work of the committee (or commission), according to this same report it includes:

- "(1) Service of ordinary W. T. time signals used by mariners and by all countries within reach.
- (2) Scientific rhythmic signals, with the immediate publication of the corresponding hour according to the Observatory of Paris.

³See page 233 of these *Publications*.

(3) Various experimental sets of signals, instituted for purposes of longitude and to study circumstances of transmission.

(4) The establishment in connection with the Observatory of Paris of a permanent laboratory for the study of time problems, drawing in the collaboration of numerous scientific men who have otherwise no direct connection with astronomy.

(5) Organization and collection of times of receipt of signals over the globe.

(6) Publication of circulars for information, of memoirs of discussion and experimental research."

It should have been stated earlier in this paper that the International Geodetic and Geophysical Union held its meetings at Rome at the same time and in the same building, the Palazzo Corsini, the home of the Reale Accademia dei Lincei. The two unions united in the ceremonial opening session on May 2nd in the great hall of the Orazi and Curiazi in the Campidoglio, a session "made memorable by the presence of His Majesty the King of Italy, and also of Cardinal Maffi, the titular head of the Vatican Observatory. It was stated that this was the first visit paid by a Cardinal to the Capitol of Rome since 1870—a significant illustration of the power of astronomy to heal old wounds of the past."

In addition to the committee meetings, the importance of which has been emphasized in what has preceded, the International Astronomical Union held four full sessions on May 3, 4, 9 and 10, in the rooms of the Accademia dei Lincei. At the first of these, Professor V. Cerulli gave the address of welcome on the part of the Italian astronomers, and M. Baillaud delivered his presidential address. At the second, the president moved addresses to His Majesty the King of Italy, the Minister of Public Instruction and to the Syndics of the City of Rome. At these two meetings various questions of general policy were discussed, nominating and finance committees were selected, and recorders for the meeting appointed. Three languages were used in the meetings, French, English and Italian, the recorders making translation whenever necessary.

At the two closing sessions, the reports of the thirty-two committees were presented, amended in some details, and then approved; the membership of the twenty-six committees for the next tri-ennium announced and confirmed; the report of the Finance Committee adopted; the date and place of the next

meeting settled; and officers for the next three years elected. As already announced in these Publications, the next general meeting will be held at Cambridge, England, in 1925, and the officers are:

President: W. W. Campbell, (U. S. A.)

Vice-Presidents: Professor Cerulli (Italy); M. Deslandres (France); Professor Hirayama (Japan); Mr. Hough (Great Britain); Professor DeSitter (Holland).

Grants recommended by the Finance and Executive Committees were approved, as follows:

Bureau de l'Heure	50,000 francs per annum
Variation of Latitude	10,000 francs per annum
Carte du Ciel	5,000 francs per annum
Dauble Stars	2,000 francs per annum
Variable Stars	1,200 francs per annum

M. Baillaud's closing address emphasized the importance of the work already accomplished and its prophecy for the even greater success of the Union in the future. Responding, Professor Turner, of Oxford, thanked M. Baillaud in the name of all of the delegates for the able manner in which he had discharged the duties of his office, saying that "we owed to him the construction of a splendid edifice upon a solid basis."

I cannot omit a brief but very grateful reference to the many courtesies extended to the delegates at Rome. The official recognition of our meetings by King and Cardinal has already been noted. In addition, the Pope granted the delegates of the two unions a special audience at noon on May 10th; the city opened all the museums and galleries to us; the local committee hospitably provided buffets⁴ for light refreshments on both floors of the palace where our meetings were held; receptions and teas were given in the Campidoglio, on the Palatine Hill and in the galleries of the Palazzo Corsini; and excursions to Tivoli and other points of interest were arranged for us on May 7th.

With the close of the meeting, the astronomers and their friends of the Geodetic and Geophysical Union came to the parting of the ways. The latter traveled southward to Messina

⁴On several of their busier days, some members of the Executive Committee found time for no other luncheon than a biscuit and coffee or a glass of wine at these buffets.

and Mt. Etna, but most of the astronomers turned their faces northward to Florence, to accept the city's invitation to be its guests on May 12th. A formal but cordial reception in the Palazzo Vecchio, an inspection of the National Military and Geographic Institute, a visit to the Museum of Natural Science where Galileo's telescopes are preserved (*with the privilege of handling and looking through the original telescope*), a drive (with a stop enroute at Galileo's house) to the Royal Astrophysical Observatory at Arcetri, where Signore A. Abetti and Giorgio Abetti, with their families, welcomed us, tea at the Geophysical Institute at Arcetri and, last, the return to the city at sunset by way of the beautiful Viale Michalangiolo—this was the program our kindly hosts had prepared for us; one that left us ready for repose when night fell, but that will afford us happy memories through the years.

According to the calendar, the year 1920 was the centenary year of the Royal Astronomical Society of London, but conditions then existing made it necessary to defer its formal celebration to the present year. The Council set the date for May 29th to 31st, chiefly to give its Foreign Associates and other astronomers who had come to the Rome meeting the opportunity to attend and share in the proceedings, a courtesy for which we shall always be grateful.

The Conversazioni, on Monday evening, May 29th, in the rooms of the Royal Society, Burlington House, afforded the opportunity to greet old friends and to make new acquaintances, while inspecting books, photographs, transparencies and instruments illustrating the work of members of the society. Short illustrated lectures, in the lecture hall on the lower floor, were an added attraction. The historical meeting was held on the following forenoon, in the Society's own rooms across the court. After greetings from the King and letters and telegrams of congratulations from societies and individual astronomers had been read, Professor A. S. Eddington gave the President's address, which I wish space limits might permit me to quote. He then called first upon Dr. J. L. E. Dreyer and afterwards upon Professor H. H. Turner who gave, respectively, a review of the Society's history, and biographical sketches, illustrated by slides,

of some of the great astronomers who have helped to make that history. Our own society, it will be recalled had awarded its Bruce Gold Medal for the year 1922 to the Astronomer Royal, Sir Frank W. Dyson, and it was my privilege, as the representative of our Society, to hand the medal to Sir Frank, at the close of Professor Turner's address. At the scientific session in the afternoon, six of the Society's Associates, Messrs. Seares, Shapley, St. John, Hertzsprung, Strömgren and Aitken, spoke briefly of their own work, and the celebration proper closed with the formal banquet, at the Criterion Restaurant, in the evening. On the following day, however, the British Astronomical Association held a special meeting, in honor of the Centenary, at which Dr. Harlow Shapley gave the principal address—on variable stars—and Messrs. Seares, St. John and Aitken spoke briefly; and on June 3rd, all of the visiting astronomers were invited to the Royal Observatory at Greenwich, to join in the inspection of the observatory on the Annual Visitation Day.

It is often said that the individual delegate to meetings like those I have been describing profits as much from his informal association with other delegates as from the proceedings at the meetings, and there is a sense in which this is quite true. At Rome, and at London, too, were gathered representative astronomers from many countries, each a specialist with a record of good work in his own field; each one could teach the others something, and, in turn, learn many things. In effect, we all "went to school" to one another, and in the process also came to a better mutual understanding and more sympathetic appreciation of each other's point of view than any number of formal meetings could have given us. All this, by the way, makes cooperation easier.

In making plans to attend the meeting at Rome, I allowed time, as did the other American delegates, to visit some of the observatories of France, Italy and Great Britain, but space limits forbid any account of these visits here. I must content myself, in closing, with the simple but sincere expression of grateful appreciation of the many kindnesses shown to me and to my fellow delegates at every one of these institutions.